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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TUCKER, WESLEY J	
ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/839,044	CORNOG ET AL.	
	Examiner	Art Unit	
	Wes Tucker	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 17-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-13 and 17-22* is/are rejected.

7)☒ Claim(s) *7 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 25th 2007 has been entered.

Response to Amendment

2. Applicant's response filed October 25th 2007 has been entered and made of record. Applicant has amended claims 1, 7, 8 and 14. Claims 15-16 have been cancelled. New claims 21 and 22 have been added.

3. Applicant's arguments have been fully considered in view of the amended claims, but are not found persuasive for at least the following reasons:

Applicant argues that Sasaki does not disclose the claimed feature of ***"computing an estimate of motion of the desired characteristic between two images using a gradient-based method that uses the single channel images generated for the two input images and a constraint that a total of the desired characteristic is constant from one image to a next image."***

Examiner respectfully disagrees. The desired characteristic as Applicant states in the specification is either edge magnitude or proximity to a color or something else. The reference of Sasaki deals with edge magnitude, and is interpreted to read on the claim language. Sasaki discloses that edges or gradients of a certain magnitude (i.e. noticeable) are used in an optical flow calculation to detect and calculate motion estimation (column 8, lines 60-67). Sasaki further discloses that the subsequent images must be used to obtain matching edges from one image to the next obtained at different times (column 6, lines 44-67 and column 7, lines 1-15). Therefore the edge magnitude must be constant from one image to the next in order to be detected and matched. The edge magnitude is the desired characteristic and therefore the total of the edge magnitude created in the edge emphasizing (column 6, lines 52-63) and detection is interpreted as being constant from one image to the next. This discussion is presented in addition to the statements made previously with regard to optical flow. As stated in Applicant's own specification (paragraphs [0003 and [0045]) and as is well known in the art, optical flow calculation uses a constant constraint between two images. Indeed if image features found to be in motion from one image to the next are to be identified, the optical flow must be calculated by placing a constraint on a desired characteristic from one image to the next. Matching can only be performed if an image characteristic can be identified in both of the images in which motion is occurring.

Applicant states on page 7 of the remarks that ***"the use of the term 'optical flow' in Sasaki is merely coincidental and does not relate to 'optical flow constraint equations' such as utilized in gradient based methods."*** Sasaki's

method is clearly gradient-based. Edges are gradients. Sasaki clearly uses optical flow as the phrase is recited repeatedly throughout Sasaki's specification. Interpreted reasonably broadly, Sasaki reads on the claim language of the independent claims and therefore the rejection in view of Sasaki is accordingly maintained.

4. With regard to the amendments to claims 7 and 14, these claims are now objected to as containing allowable subject matter. See discussion under the section entitled Allowable subject matter.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 8, 9, 17, and 18-20 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Sasaki et al. (USPN 6,246,961).

Regarding claims 1, 2, and 17, Sasaki discloses generating a single channel image for each of two input images according to a function that measures, for each pixel, occurrence of a desired characteristic, other than luminance alone, in the input images at each pixel location to provide a value for an output pixel in the single channel

image from a range of values that represent a likelihood of the occurrence of the desired characteristic (Sasaki col. 8 lines 29-46: The reference describes generating two edge images (i.e. single channel images) which correspond to two input images. Edge images measure the likelihood of an edge (i.e. a desired characteristic).).

Sasaki further discloses computing an estimate of motion of the desired characteristic between the two images using a gradient based method using the single channel images generated for the two input images and using as a constraint that a total of the desired characteristic is constant from one image to the next (Sasaki col. 8 lines 29-46: The reference describes detecting optical flow (i.e. a gradient based motion estimation method) between the two edge images (i.e. the single channel images). As is well know in the art—and stated throughout applicant's own disclosure—the optical flow calculation uses a constant constraint between two images. Since these two images represent the desired characteristic, the claim limitation is met. This is confirmed by applicant's own disclosure in several instances (see e.g. at paragraph [0003] and [0045].).

Regarding claims 8, 9, 18, and 20 Sasaki discloses an apparatus for performing the method of claim 1 (see figure 1).

With regard to new claims 21 and 22, Sasaki discloses detecting optical flow (Fig. 8).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 4-6, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki as applied above, and further in view of Von Brandt (USPN 4,924,310).

Regarding claims 4 and 5, Sasaki discloses detecting a potential collision according to the estimate of motion, but fails to expressly disclose using the motion estimate to performing processing on the image such as interpolation between two images. Von Brandt, however, discloses using a motion estimate to interpolate between two images (Von Brandt col. 1 lines 40-54). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Sasaki's motion estimation method by using the estimate to interpolate between two images as taught by Von Brandt. Such a modification would have allowed for the reconstruction of missing image frames (Von Brandt col. 1 lines 40-42).

Regarding claim 6, Sasaki discloses that the desired characteristic is ege magnitude. This limitation was discussed in the 102 rejection.

Regarding claims 11-13, Sasaki disclose an apparatus for performing the method (see figure 1).

7. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Sasaki as applied above, and further in view of Kobilansky (U.S. Pat. Pub. No. US2002/0159749 A1).

Regarding claim 3, Sasaki discloses a desired characteristic, but fails to expressly disclose that this desired characteristic is proximity to a color. Kobilansky, in the same field of endeavor of image processing and the same problem solving area of motion estimation, discloses a motion estimation technique that takes into account the proximity to a color (see paragraph [0015]: The reference describes that a region in the target frame should have a color close (i.e. proximity to a color) to the same region in the reference frame.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Sasaki by having the desired characteristic as proximity to a color as taught in Kobilansky because the use of such a desired characteristic "provides enhancements to the process of estimating motion in image-sequences such as those that originate from motion pictures or television video" (see Kobilansky: paragraph [0004]).

Regarding claim 10, Sasaki discloses an apparatus for performing the method (see figure 1.)

Allowable Subject Matter

8. Claims 7 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wes Tucker
1-10-08

Matthew C. Bella

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